

502

## **RAW SEQUENCE LISTING**

**The Biotechnology Systems Branch of the Scientific and Technical Information Center (STIC) no errors detected.**

Application Serial Number: 10/511,6/6  
Source: P4710  
Date Processed by STIC: 11/5/06

# ***ENTERED***



PCT

## RAW SEQUENCE LISTING

DATE: 01/05/2006

PATENT APPLICATION: US/10/511,616

TIME: 11:16:27

Input Set : A:\PTO.RJ.txt

Output Set: N:\CRF4\01052006\J511616.raw

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3 <110> APPLICANT: Washington University
5 <120> TITLE OF INVENTION: Regulated Attenuation of Live Vaccines to Enhance Cross-
Protective
6     Immunogenicity
8 <130> FILE REFERENCE: 56029-40434
C--> 10 <140> CURRENT APPLICATION NUMBER: US/10/511,616
C--> 11 <141> CURRENT FILING DATE: 2004-10-15
13 <150> PRIOR APPLICATION NUMBER: US 60/373,626
14 <151> PRIOR FILING DATE: 2002-04-18
16 <150> PRIOR APPLICATION NUMBER: US 60/372,616
17 <151> PRIOR FILING DATE: 2002-04-15
19 <160> NUMBER OF SEQ ID NOS: 21
21 <170> SOFTWARE: PatentIn version 3.1
23 <210> SEQ ID NO: 1
24 <211> LENGTH: 25
25 <212> TYPE: DNA
26 <213> ORGANISM: Artificial Sequence
28 <220> FEATURE:
29 <223> OTHER INFORMATION: Synthetic oligonucleotide
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36 <211> LENGTH: 25
37 <212> TYPE: DNA
38 <213> ORGANISM: Artificial Sequence
40 <220> FEATURE:
41 <223> OTHER INFORMATION: Synthetic oligonucleotide
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47 <210> SEQ ID NO: 3
48 <211> LENGTH: 25
49 <212> TYPE: DNA
50 <213> ORGANISM: Artificial Sequence
52 <220> FEATURE:
53 <223> OTHER INFORMATION: Synthetic oligonucleotide
55 <400> SEQUENCE: 3
56 ccgaattcat cccgtcaggg aacgg                                25
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60 <211> LENGTH: 25
61 <212> TYPE: DNA
62 <213> ORGANISM: Artificial Sequence
64 <220> FEATURE:
65 <223> OTHER INFORMATION: Synthetic oligonucleotide
67 <400> SEQUENCE: 4

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73 <212> TYPE: DNA
74 <213> ORGANISM: Artificial Sequence
76 <220> FEATURE:
77 <223> OTHER INFORMATION: Synthetic oligonucleotide
79 <400> SEQUENCE: 5
80 ggggtacctg gcaactttcc ggcgg                               25
83 <210> SEQ ID NO: 6
84 <211> LENGTH: 25
85 <212> TYPE: DNA
86 <213> ORGANISM: Artificial Sequence
88 <220> FEATURE:
89 <223> OTHER INFORMATION: Synthetic oligonucleotide
91 <400> SEQUENCE: 6
92 ccgaattcct tttatgacgc cggac                               25
95 <210> SEQ ID NO: 7
96 <211> LENGTH: 25
97 <212> TYPE: DNA
98 <213> ORGANISM: Artificial Sequence
100 <220> FEATURE:
101 <223> OTHER INFORMATION: Synthetic oligonucleotide
103 <400> SEQUENCE: 7
104 ccgaattcct atgattaagg aggca                               25
107 <210> SEQ ID NO: 8
108 <211> LENGTH: 25
109 <212> TYPE: DNA
110 <213> ORGANISM: Artificial Sequence
112 <220> FEATURE:
113 <223> OTHER INFORMATION: Synthetic oligonucleotide
115 <400> SEQUENCE: 8
116 gcgagctcgc gatatagttc gcata                               25
119 <210> SEQ ID NO: 9
120 <211> LENGTH: 29
121 <212> TYPE: DNA
122 <213> ORGANISM: Artificial Sequence
124 <220> FEATURE:
125 <223> OTHER INFORMATION: Synthetic oligonucleotide
127 <400> SEQUENCE: 9
128 ggcggatcct gtcattaat gagcggaat                           29
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132 <211> LENGTH: 29
133 <212> TYPE: DNA
134 <213> ORGANISM: Artificial Sequence
136 <220> FEATURE:
137 <223> OTHER INFORMATION: Synthetic oligonucleotide
139 <400> SEQUENCE: 10
140 gccgaattca agtaacgata cctacaggc                           29

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149 <223> OTHER INFORMATION: Synthetic oligonucleotide
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155 <210> SEQ ID NO: 12
156 <211> LENGTH: 29
157 <212> TYPE: DNA
158 <213> ORGANISM: Artificial Sequence
160 <220> FEATURE:
161 <223> OTHER INFORMATION: Synthetic oligonucleotide
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164 ccgaagcttt cactgcaacc atgaatgac 29
167 <210> SEQ ID NO: 13
168 <211> LENGTH: 30
169 <212> TYPE: DNA
170 <213> ORGANISM: Artificial Sequence
172 <220> FEATURE:
173 <223> OTHER INFORMATION: Synthetic oligonucleotide
175 <400> SEQUENCE: 13
176 cgggatccgt tatcggcaat ctggaggcaa 30
179 <210> SEQ ID NO: 14
180 <211> LENGTH: 30
181 <212> TYPE: DNA
182 <213> ORGANISM: Artificial Sequence
184 <220> FEATURE:
185 <223> OTHER INFORMATION: Synthetic oligonucleotide
187 <400> SEQUENCE: 14
188 catgcatgca ggcaggttca ggtacggtga 30
191 <210> SEQ ID NO: 15
192 <211> LENGTH: 27
193 <212> TYPE: DNA
194 <213> ORGANISM: Artificial Sequence
196 <220> FEATURE:
197 <223> OTHER INFORMATION: Synthetic oligonucleotide
199 <400> SEQUENCE: 15
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203 <210> SEQ ID NO: 16
204 <211> LENGTH: 27
205 <212> TYPE: DNA
206 <213> ORGANISM: Artificial Sequence
208 <220> FEATURE:
209 <223> OTHER INFORMATION: Synthetic oligonucleotide
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212 ccgaattcag cagactgaac cgccagt 27
215 <210> SEQ ID NO: 17

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227 <210> SEQ ID NO: 18
228 <211> LENGTH: 27
229 <212> TYPE: DNA
230 <213> ORGANISM: Artificial Sequence
232 <220> FEATURE:
233 <223> OTHER INFORMATION: Synthetic oligonucleotide
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239 <210> SEQ ID NO: 19
240 <211> LENGTH: 230
241 <212> TYPE: PRT
242 <213> ORGANISM: Streptococcus pneumoniae
244 <400> SEQUENCE: 19
246 Leu Gln Ala Ser Asn Glu Ser Gln Arg Lys Glu Ala Asp Lys Lys Ile
247 1 5 10 15
250 Lys Glu Ala Thr Gln Arg Lys Asp Glu Ala Glu Ala Ala Phe Ala Thr
251 20 25 30
254 Ile Arg Thr Thr Ile Val Val Pro Glu Pro Ser Glu Leu Ala Glu Thr
255 35 40 45
258 Lys Lys Lys Ala Glu Glu Ala Thr Lys Glu Ala Glu Val Ala Lys Lys
259 50 55 60
262 Lys Ser Glu Glu Ala Ala Lys Glu Val Glu Val Glu Lys Asn Lys Ile
263 65 70 75 80
266 Leu Glu Gln Asp Ala Glu Asn Glu Lys Lys Ile Asp Val Leu Gln Asn
267 85 90 95
270 Lys Val Ala Asp Leu Glu Lys Gly Ile Ala Pro Tyr Gln Asn Glu Val
271 100 105 110
274 Ala Glu Leu Asn Lys Glu Ile Ala Arg Leu Gln Ser Asp Leu Lys Asp
275 115 120 125
278 Ala Glu Glu Asn Asn Val Glu Asp Tyr Ile Lys Glu Gly Leu Glu Gln
279 130 135 140
282 Ala Ile Thr Asn Lys Lys Ala Glu Leu Ala Thr Thr Gln Gln Asn Ile
283 145 150 155 160
286 Asp Lys Thr Gln Lys Asp Leu Glu Asp Ala Glu Leu Glu Leu Glu Lys
287 165 170 175
290 Val Leu Ala Thr Leu Asp Pro Glu Gly Lys Thr Gln Asp Glu Leu Asp
291 180 185 190
294 Lys Glu Ala Ala Glu Ala Glu Leu Asn Glu Lys Val Glu Ala Leu Gln
295 195 200 205
298 Asn Gln Val Ala Glu Leu Glu Glu Leu Ser Lys Leu Glu Asp Asn
299 210 215 220
302 Leu Lys Asp Ala Glu Thr

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306 <210> SEQ ID NO: 20
307 <211> LENGTH: 257
308 <212> TYPE: PRT
309 <213> ORGANISM: Streptococcus pneumoniae
311 <400> SEQUENCE: 20
313 Leu Gln Ser Pro Val Ala Ser Gln Ser Lys Ala Glu Lys Asp Tyr Asp
314 1                5                10                15
317 Ala Ala Lys Lys Asp Ala Lys Asn Ala Lys Lys Ala Val Glu Asp Ala
318                20                25                30
321 Gln Lys Ala Leu Asp Asp Ala Lys Ala Ala Gln Lys Lys Tyr Asp Glu
322                35                40                45
325 Asp Gln Lys Lys Thr Glu Glu Lys Ala Ala Leu Glu Lys Ala Ala Ser
326                50                55                60
329 Glu Glu Met Asp Lys Ala Val Ala Ala Val Gln Gln Ala Tyr Leu Ala
330 65                70                75                80
333 Tyr Gln Gln Ala Thr Asp Lys Ala Ala Lys Asp Ala Ala Asp Lys Met
334                85                90                95
337 Ile Asp Glu Ala Lys Lys Arg Glu Glu Glu Ala Lys Thr Lys Phe Asn
338                100               105               110
341 Thr Val Arg Ala Met Val Val Pro Glu Pro Glu Gln Leu Ala Glu Thr
342                115               120               125
345 Lys Lys Lys Ser Glu Glu Ala Lys Gln Lys Ala Pro Glu Leu Thr Lys
346                130               135               140
349 Lys Leu Glu Glu Ala Lys Ala Lys Leu Glu Glu Ala Glu Lys Lys Ala
350 145               150               155               160
353 Thr Glu Ala Lys Gln Lys Val Asp Ala Glu Glu Val Ala Pro Gln Ala
354                165               170               175
357 Lys Ile Ala Glu Leu Glu Asn Gln Val His Arg Leu Glu Gln Glu Leu
358                180               185               190
361 Lys Glu Ile Asp Glu Ser Glu Ser Glu Asp Tyr Ala Lys Glu Gly Phe
362                195               200               205
365 Arg Ala Pro Leu Gln Ser Lys Leu Asp Ala Lys Lys Ala Lys Leu Ser
366                210               215               220
369 Lys Leu Glu Glu Leu Ser Asp Lys Ile Asp Glu Leu Asp Ala Glu Ile
370 225               230               235               240
373 Ala Lys Leu Glu Asp Gln Leu Lys Ala Ala Glu Glu Asn Asn Asn Val
374                245               250               255
377 Glu
381 <210> SEQ ID NO: 21
382 <211> LENGTH: 487
383 <212> TYPE: PRT
384 <213> ORGANISM: Streptococcus pneumoniae
386 <400> SEQUENCE: 21
388 Leu Gln Ala Ser Asn Glu Ser Gln Arg Lys Glu Ala Asp Lys Lys Ile
389 1                5                10                15
392 Lys Glu Ala Thr Gln Arg Lys Asp Glu Ala Glu Ala Ala Phe Ala Thr
393                20                25                30
396 Ile Arg Thr Thr Ile Val Val Pro Glu Pro Ser Glu Leu Ala Glu Thr

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**VERIFICATION SUMMARY**

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Input Set : A:\PTO.RJ.txt

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L:10 M:270 C: Current Application Number differs, Replaced Current Application Number

L:11 M:271 C: Current Filing Date differs, Replaced Current Filing Date